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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/774,926	01/31/2001	Tomokazu Kakumoto	15162/03120	5322

24367 7590 06/02/2005

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EXAMINER	
YE, LIN	

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/774,926	KAKUMOTO ET AL.	
	Examiner	Art Unit	
	Lin Ye	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) *5 and 7-17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 October 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/31/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments of Election/Restrictions

1. Applicant's election without traverse of the species D (Figures 1,3 and 7) which read on claims 1-4 and 6 in the reply filed on 1/24/05 is acknowledged.

2. Claims 5 and 7-17 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 1/24/05.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1,3 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. U.S. Patent 6,128,039.

Referring to claim 1, the Chen reference discloses in Figures 6 and 7, a solid-state image-sensing device comprising: a plurality of pixels (301) arranged in a matrix and each

generating an electric signal proportional to an amount of incident light; a plurality of selector circuits (e.g., row selecting switch M3, switch k1, k2 and k3) provided one for each column of the matrix of the pixels and each having a single buffer (the switching capacitor amplifier 406 is a single buffer, See Col. 7, lines 65-67 and Col. 8, lines 1-14), the selector circuits each receiving, from a plurality of pixels belonging to a corresponding column of the matrix, image signals (V_{image}) and noise signals (black signal level V_{BLK}) representing variations in sensitivity and then outputting the image signals and the noise signals alternately through the single buffer (See Figure 7H); and a correction circuit (a sample hold stage 408, output buffer stage 410 and differential amplifier 413) receiving the image signals and the noise signals sequentially from one selector circuit after another and correcting the image signals on a basis of the noise signals (See Col. 11, lines 8-22).

Referring to claim 3, the Chen reference discloses wherein the selector circuits each comprise: a first holding circuit (c1 and c2) for sampling and holding the image signals output from the pixels (e.g., during the period T6 –T7 as shown in Figure 7H); and a second holding circuit (c1 and c2) for sampling and holding the noise signals output from the pixels (e.g., during the period T8-T9 as shown in Figure 7H); wherein, in each selector circuit (k1), the image signals and the noise signals are first sampled and held in the first and second holding circuits respectively, and are then alternately fed through the single buffer (406) to the correction circuit (408, 410 and 413).

Referring to claim 4, the Chen reference discloses wherein the correction circuit comprises: a third holding circuit (C3) for sampling and holding the image signals output from the first holding circuits provided in the selector circuits; a fourth holding circuit (C4)

for sampling and holding the noise signals output from the second holding circuits provided in the selector circuits (See Col. 10, lines 1-24); and a differential amplifier (413) for outputting the image signals after correcting the image signals by subtracting the noise signals output from the fourth holding circuit from the image signals output from the third holding circuit (See col. 10, lines 25-64).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. U.S. Patent 6,128,039 in view of Kozlowski et al. U.S. Patent 6,587,142.

Referring to claim 2, the Chen reference discloses all subject matter as discussed with respected to claim 1, except that the Chen reference does not explicitly show a plurality of constant-current sources provided one for each column of the matrix.

The Kozlowski reference teaches in Figure 2, a CMOS image sensor comprising an array of 1032 columns by 776 rows of photo detectors (See Col. 6, lines 51-55); and plurality of constant-current sources (ISRC common current source 30) provided one for each column of the matrix and each supplying a constant current to pixels belonging to a corresponding column of the matrix. The Kozlowski reference is evidence that one of ordinary skill in the

art at the time to see more advantages the constant-current source provided one for each column of the matrix image sensor so that efficiently transfers the conditioned, photo-induced signals voltage from each row-selected photo detector (See Col. 8, lines 15-23). For that reason, it would have been obvious to one of ordinary skill in the art to modify the image-sensing device of Chen ('039) by providing plurality of constant-current sources to one for each column of the matrix and each supplying a constant current to pixels belonging to a corresponding column of the matrix as taught by Kozlowski ('142).

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. U.S. Patent 6,128,039 in view of Collins et al. U.S. 6,507,519.

Referring to claim 6, the Chen reference discloses all subject matter as discussed with respected to claim 1, except that the Chen reference does not explicitly show the electric signal output from each pixel is natural-logarithmically proportional to the amount of incident light.

The Collins reference teaches in Figures 2-3, an image-sensing device (See Col. 5, lines 41) comprising: a plurality of pixels (each pixels show in Figure 3) that generate an electric signal proportional to an amount of incident light and then output the electric signal (V_x) as an analog signal that is natural-logarithmically proportional to the amount of incident light (See Col. 5, lines 65-66). The Collins reference is evidenced that one of ordinary skill in the art at the time of the invention to see more advantages when the imaging-sensing device is a logarithmic type imaging sensor so that has very wide dynamic range with makes the imaging-sensing device suitable for imaging external scenes (See Col. 6, lines 15-22). For

that reason, it would have been obvious one having ordinary skill in the art at the time of the invention was made to modify the imaging-sensing device of Chen ('039) by providing a logarithmic type imaging sensor for generating the output imaging electric signal as an analog signal that is natural-logarithmically proportional to the amount of incident light as taught by Collins ('519).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

   a. Borg et al. U.S 6,476,864 discloses pixel column amplifier architecture creates a reduced noise differential image signal form a pixel sensor array.

   b. Funakoshi et al. U.S. 6,498,332 discloses a drive circuit having a differential amplifier, a current controller formed form an MOSFET device.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lin Ye whose telephone number is (571) 272-7372. The examiner can normally be reached on Mon-Fri 8:00AM-5:00PM.

   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James J. Goody can be reached on (571) 272-7950. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lin Ye
Examiner
Art Unit 2615

May 26, 2005